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AMSAT NEWS SERVICE
ANS-187

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor(a)amsat.org

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see:
http://www.amsat.org/mailman/listinfo/ans

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SB SAT @ AMSAT $ANS-187.01
ANS-187 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 187.01
>From AMSAT HQ KENSINGTON, MD.
DATE 2020 July 05
To All RADIO AMATEURS
BID: $ANS-187.01

Successful Launch of BY70-2 With FM-to-Codec2 Transponder

Wei Mingchaun, BG2BHC, reports on Twitter that BY70-2 was launched on July 3 at 03:10z from Taiyuan Satellite Launch Center on a CZ-4B launch vehicle. BY70-2 will serve as a replacement for BY70-1, a 2U CubeSat which launched on December 26, 2016. Due to a booster failure, BY70-1 was placed in an elliptical orbit with a low perigee and the satellite's orbit decayed in February 2017.

Unlike BY70-1, which carried an FM transponder, BY70-2 carries an FM-to-Codec2 transponder similar to the ones on board LO-90 and Taurus-1. More information about working this type of transponder can

be found in an article entitled "Digital Voice on Amateur Satellites: Experiences with LilacSat-OSCAR 90" by Paul Stoetzer, N8HM, in the January/February 2019 issue of The AMSAT Journal. The article can also be found on the AMSAT website at https://tinyurl.com/ANS-166-BY70-2.

BY70-2 is in a sun-synchronous orbit with an altitude of approximately 500 km. As a replacement, the satellite is sharing BY70-1's IARU coordination and ITU API notification. The uplink frequency is 145.920 MHz and the downlink frequency is 436.200 MHz.

[ANS thanks Wei Mingchaun, BG2BHC, for the above information]

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27-Jun-2020 at 13:30 UTC. The contact was completed between IN80fl in Spain and JJ40ql in Gabon.

These are the latest in a series of new records set over the past few months, including:
EO-88 – 4,086 km. F4DXV in JN04iu <> VO1FOG in GN37in.
  02-Apr-2020 at 23:20 UTC.
PO-101 (FM) – 5,128 km. EA4SG in IN80cp77em<> R9LR in MO27qf72nd.
  06-May-2020 at 23:03 UTC.
RS-44 – 8,357 km. W5CBF in EM30jf35qi <> DL4EA in JN48ko94cw.
  26-May-2020
AO-92 (L/V) – 4,202 km. OA4/XQ3SA in FH17lv <> XE1MEX in EK08mu.
  03-Jun-2020 at 04:07 UTC.
AO-27 – 5,682 km. E21EJC in OK03fp <> R9LR in MO27qf.
  09-Jun-2020 at 23:45 UTC
XW-2B – 4,978 km. KE9AJ in DM79iq47 <> FG8OJ in FK96ig17.
  20-Jun-2020 at 11:14 UTC.

Congratulations to all of these operators for their patience and their operating skill.

[ANS thanks Paul Stoetzer, N8HM, AMSAT Executive Vice-President, for the above information]

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WD9EWK (DM45)  100     106
K3HPA    New     102
WA9WUD   New     102
KI5HHK   New     101
N8URE    New     101
KD9NGV   New     100
KP4RV    New     100
W8LR     New     100
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If you find errors or omissions. please contact me off-list at W5RKN [at] W5RKN.com and I'll revise the announcement. This list was developed by comparing the ARRL .pdf listings for the two months. It's a visual comparison so omissions are possible. Apologies if your call was not mentioned. Thanks to all those who are roving to grids that are rarely on the birds. They are doing most of the work!

[ANS thanks Ron Parsons, W5RKN, for the above information]

Virginia Air and Space Center Discontinues KE4ZXW Demo Station

The Virginia Air and Space Center in Hampton,Virginia has ended its twenty-five year relationship with the KE4ZXW Amateur Radio Demonstration Station. Robert Griesmer, Executive Director and CEO of the Virginia Air and Space Center has directed that the KE4ZXW Amateur Radio Demonstration Station located at the Virginia Air and Space Center (VASC) be disassembled and removed from the Center by June 30.

In his June 5,2020, update Mr. Griesmer advised the following to the KE4ZXW group : “I am writing to you to inform you that, after careful consideration, we have decided to discontinue the Ham Radio Station Exhibit effective July 1st upon the re-opening of the Center.” Randy Grigg, WB4KZI, president of the Amateur Radio group, thanked the volunteers who have supported and operated the station for the last 25 years.

The station has spent the last quarter of a century demonstrating the use of Amateur Radio, its applications as a STEM Activity, communications skills and communications through amateur satellites to school groups. The station also made contacts to the International Space Station.

The KE4ZXW Amateur Radio station's equipment has found a new home with K4KDJ, the Virginia Tech Amateur Radio Association in Blacksburg, Va.

[ANS thanks ARRL for the above information]

AMSAT 2020 Board of Directors Election Upcoming

The nomination period for this year's AMSAT Board of Directors election ended June 15. The following candidates have been found to have their membership in good standing and their nomination credentials in order:

Howard DeFelice, AB2S
Mark Hammond, N8MH
Jeff Johns, WE4B
Robert McGwier, N4HY
Bruce Paige, KK5DO
Paul Stoetzer, N8HM

This year, AMSAT will be electing three voting members of the Board of Directors. These will go to the three candidates receiving the highest number of votes. In addition, there will be two alternates chosen, based on the next highest number of votes received.

Further details regarding the mechanics of the election will appear in ANS in the near future. Ballots will be mailed to the AMSAT membership by July 15th based on a membership list that will be generated as early as July 1. Members are encouraged to use the AMSAT Membership Portal at launch.amsat.org to verify that their membership is in good standing and their mailing address is correct.

[ANS thanks Brennan Price, N4QX, AMSAT Secretary, for the above information]

CAS-6 Becomes TO-108, Confusion Ensues

At the request of CAMSAT and the CAS-6 team, Drew Glasbrenner, KO4MA, AMSAT VP Operations & OSCAR Number Administrator announced last week that CAS-6 (TQ-1) would receive the official designation of TQ-OSCAR 108 (TO-108).

Since that designation, TO-108 was added to the AMSAT Live OSCAR Satellite Status Page at https://www.amsat.org/status/ However, an entry for CAS-6 also remains on that page. Further, AMSAT TLE distributions continue to list the satellite as CAS-6 (NORAD Cat ID 44881).

Operators should be aware that the designations CAS-6 and TO-108 both refer to the same satellite, and should be on the lookout for changes in the naming on websites and in TLE distribution sets. It many take a week or two before consistent naming filters through all systems.

Frequencies for the intended radio amatuer mission are:
- CW Telemetry Beacon: 145.910 MHz
- AX.25 4.8kbps GMSK Telemetry: 145.890 MHz
- U/V Linear Transponder Downlink: 145.925 MHz, 20 kHz bandwidth
- U/V Linear Transponder Uplink: 435.280 MHz, Inverted

Operator reports indicate that the transponder is active only for brief intervals of about 2 seconds, spaced approximately 5 seconds apart. With patience, and quick transmissions, QSOs have been completed.

[ANS thanks Mark Johns, K0JM, for the above information]

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Since the project has focused heavily on high earth orbit, geostationary orbit, and the lunar opportunity with Gateway, the challenges of low earth orbit (ISS) now need to be addressed. This will be an ongoing process. Here's what participants recommended at SDMG:

Since there are LEO constellations up to and including Ka band, the tracking and doppler have been done. It's just a question of learning the requirements, design patterns, limitations, and techniques.

Since the project already incorporates the near-space communications recommendations from Consultative Committee for Space Data Systems (CCSDS), little has to be done in that regard.

HamTV on ISS is at 2.4 GHz, which while lower than the projected 5 GHz and 10 GHz, has all the other aspects of broadband digital. There is plenty to be learned from those experiments, and meetings are being set up to begin to collaborate with the principals of HamTV on deeply appreciated advice & next steps.

There was strong advice to eliminate antenna pointing. Use of an antenna system in space and on the ground that does not require tracking would dramatically increase adoption. With Adaptive Coding and Modulation, all sorts of systems can be accommodated. However, a ground station that does track can use a directional antenna with a lot more gain, and get a much higher bitrate, while a station with a 120 degree field of view would get a lower bitrate, but would not have to track at LEO. This needs thorough link budgeting.

There are several link budgets in Jupyter Notebook in progress at https://github.com/phase4space/payload-dmt Others interested in helping here are most welcome.

Testing for human rated spacecraft incurs a substantial increase in engineering, paperwork, and time requirements. Putting the equipment outside instead of inside does not eliminate the testing requirements. This is going to require advice/direction from ARISS.

Space heritage of this type, where equipment is an external payload only requiring power, makes hosted payload options easier to negotiate. There are 5-6 GEO missions going up in the next 3 years that could be targeted.

Doppler is a factor here, and SDMG participants received strong recommendations about talking with particular ARISS team members with experience. SDMG will be learning from and incorporating their advice in the very near future.

[ANS thanks Michelle Thompson, W5NYV, Member of the AMSAT Board of Directors, for the above report]

ARISS NEWS

Amateurs and others around the world may listen in on contacts between amateurs operating in schools and allowing students to interact with astronauts and cosmonauts aboard the International Space Station. The downlink frequency on which to listen is 145.800 MHz worldwide.

Scheduled contacts and events:

Don Bosco Haacht Technisch en Beroepsonderwijs, Haacht, Belgium, Multi-point telebridge via AB1OC. (A multi-point telebridge contact means that each student will be on the telebridge from their own home.) The ISS callsign is presently scheduled to be NA1SS, and the

scheduled astronaut is Chris Cassidy, KF5KDR. The contact is go for
Friday, July 10 at 10:49:51 UTC (27 degrees maximum elevation).

ARISS is very aware of the impact that COVID-19 is having on schools
and the public in general. As such, we may have last minute cancella-
tions or postponements of school contacts.

[ANS thanks Charlie Sufana, AJ9N, one of the ARISS operation team men-
tors for the above information]

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DN63 (Some Day passes)
DN64 fir a few days of fly fishing
then DN55 – DN68, and getting home on July 31st….

** Postponed ** DL88: Ron (@AD0DX) and Doug (@N6UA) are making another run at the elusive DL88 in Big Bend National Park, TX. As we know they tried this grid back in March, and due to the mud couldn't get to the grid, so never ones to quit, off they go again. Today the tentative date is Monday July 6th, 2020. They will be using the K5Z call sign. More information is available at the K5Z QRZ Page.

Please submit any additions or corrections to Ke0pbr (at) gmail.com

[ANS thanks Paul Overnfor, KE0PBR, AMSAT rover page manager, for the above information]

Hamfests, Conventions, Maker Faires, and Other Events

Want to see AMSAT in action or learn more about amateur radio in space? AMSAT Ambassadors provide presentations, demonstrate communicating through amateur satellites, and host information tables at club meetings, hamfests, conventions, maker faires, and other events.

Due to COVID-19, many hamfest and events around the United States have been cancelled or postponed. While we make every effort to ensure the information contained below is correct, there may be some that we missed. We wish all of you safekeeping and hope to be at a hamfest near you soon.

Current schedule:
* Shelby NC Hamfest (Contact N4HF for info or if you want to help.)
Phil Jenkins, N4HF, is planning to present a forum – and set-up/man an info table – at the Shelby NC Hamfest Friday/Saturday Sept 4 & 5. (the 'fest runs Sept 4-6, but he'll probably only be there Friday and Saturday). Demos possible if additional volunteers step up.

A copy of the AMSAT hamfest brochure is available for download from: https://bit.ly/2ygVFmV This color brochure is designed to be printed double-sided and folded into a tri-fold handout.

To include your upcoming AMSAT presentation and/or demonstration, please send an email to ambassadors (at) amsat (dot) org.

[ANS thanks Robert Bankston, KE4AL, AMSAT VP-User Services for the above information]

Satellite Shorts From All Over

+ There has been further work on trying FT8 for EME, this time on 1296. It turns out that, contrary to the original news item, the Doppler spread on the lower bands is not an issue, since the energy distribution of the EME signal is mainly concentrated in a much narrower spectrum than the maximum total Doppler spread. This means that it can work probably with little degradation on bands up to and including 1296, under most circumstances. For a writeup of this work please see http://bobatkins.com/radio/FT8_EME_1296.html
(ANS thanks Charles Suckling, G3WDG, via Southgate ARC, for the above information)

+ Two ISS astronauts, including newly-arrived Bob Behnken, KE5GGX, per-

formed a spacewalk to replace batteries on the outside of the station (and dropped a handheld mirror which promptly became the newest piece of space debris). (ANS thanks The Orbital Index for the above information)

+ Hackster recently featured a nice little project using a Raspberry Pi to display the current location of the International Space Station (ISS) and its trajectory over time, using an ePaper Display, Proto-Stax Enclosure and some Python code. See https://bit.ly/2Ao9HVa (ANS thanks to hackster.io and JoAnne Maenpaa, K9JKM, for the above information)

+ The Space Science Center at Morehead State University (Kentucky) is accepting applications for a full-time position as a Space Systems Engineer – Software Engineer. For details and to apply, see: https://moreheadstate.peopleadmin.com/postings/9284 Please note: The preferred closing date has passed, but they are still accepting applications! (ANS thanks Morehead State and JoAnne Maenpaa, K9JKM, for the above information)

+ The Benchmark Space Systems team is excited to sponsor and present a complimentary “Propulsion Systems 101” workshop Wednesday July 8 at 1:00 p.m. EST (1700z) The workshop will provide satellite integrators and constellation developers with a broad overview of propulsion technologies and their associated operational capabilities. Register at: https://www.lrainstitute.com/event_post/0720-propulsion-systems/ (ANS thanks Benchmark Space Systems and JoAnne Maenpaa, K9JKM, for the above information)

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73 and Remember to help keep amateur radio in space,
This week's ANS Editor, Mark D. Johns, K0JM

k0jm at amsat dot org